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FIVE-YEAR REVIEW

RAYMARK INDUSTRIES, INC. SITE
STRATFORD, CONNECTICUT

RESPONSE ACTION CONTRACT (RAC), REGION I

For
U.S. Environmental Protection Agency

By
Tetra Tech NUS, Inc.

EPA Contract No. 68-W6-0045
EPA Work Assignment No. 050-FRFE-01H3
TtNUS Project No. N3883

September 2000

TETRA TECH NUS, INC.

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STRATFORD, CONNECTICUT

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1.0 INTRODUCTION

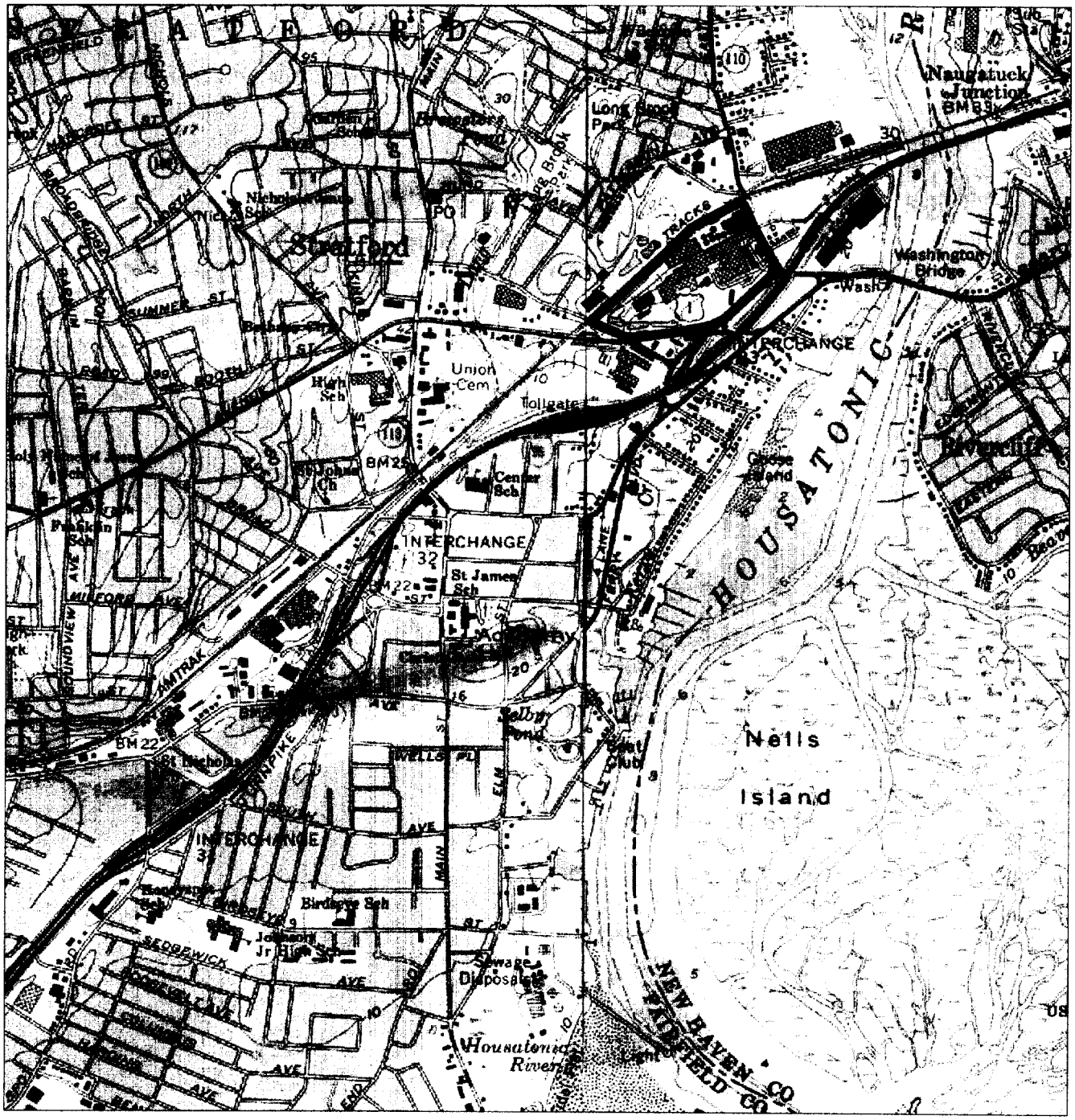
This document presents the first five-year review of the Raymark Industries, Inc. Superfund Site, Facility - Operable Unit No. 1 (OU1) in Stratford, Connecticut (Figure 1-1). Pursuant to Section 121 (c) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended, and Section 300.430 (f) (4) (ii) of the National Oil and Hazardous Substances Pollution Contingency Plan, reviews are mandated for all remedial actions which result in any hazardous substances remaining at the site. Reviews are conducted at least every five years after the initiation of the remedial action to assure that human health and the environment continue to be protected by the implemented remedial action.

This report was prepared by Tetra Tech NUS, Inc. (TtNUS) for the U.S Environmental Protection Agency (EPA) under RAC Work Assignment No. 050-FRFE-01H3. The activities conducted for the five-year review were based on the Statement of Work prepared by EPA and dated June 16, 2000 and on the approved TtNUS Draft Work Plan, dated August 2000.

1.1 Scope of the Five-Year Review

This five-year review addresses OU1 - Raymark Facility. OU1 is one of eight operable units at the Raymark Industries, Inc. Superfund Site and is the only one with a completed remedy. The source control remedy was initiated in 1995 and completed in 1997. Pursuant to the EPA's guidance *Structure and Components of Five-Year Reviews* (Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02, May 1991), five-year reviews are conducted based on the start date for the construction of a remedy. OU1 is the focus of this five-year review, as appropriate, to document the progress of remediation. The other Raymark operable units are in various stages of investigation. The status of their progress is presented in Section 2.0. It is recommended that the investigations for these sites continue as planned. Each of the operable units is listed below, and its location is shown on Figure 1-2.

- OU1 - Raymark Facility
- OU2 - Groundwater
- OU3 - Upper Ferry Creek and associated wetlands
- OU4 - The Raybestos Memorial Field

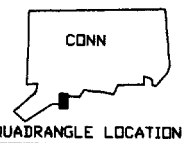


BASEMAP: PORTIONS OF THE FOLLOWING U.S.G.S. QUADRANGLE MAPS: BRIDGEPORT, CONN., 1970 (PHOTOREVISED: 1984) AND MILFORD, CONN., 1960 (PHOTOREVISED: 1984), SCALE ALTERED FOR CLARITY

OUTLINE OF OU1 RAYMARK INSUSTRIES, INC. SITE

0 1/2 1 MILE

1000 0 1000 2000 3000 4000 5000 FEET



QUADRANGLE LOCATION

SITE LOCUS – OU1 FACILITY	FIGURE 1–1
5–YEAR REVIEW	
RAYMARK – STRATFORD, CONNECTICUT	
DRAWN BY: D.W. MACDOUGALL	REV.: 0
PROJECT MANAGER: H. FORD	DATE: SEPTEMBER 20, 2000
SCALE: AS SHOWN	ACAD NAME: DWG\3883\0500\USGS.DWG

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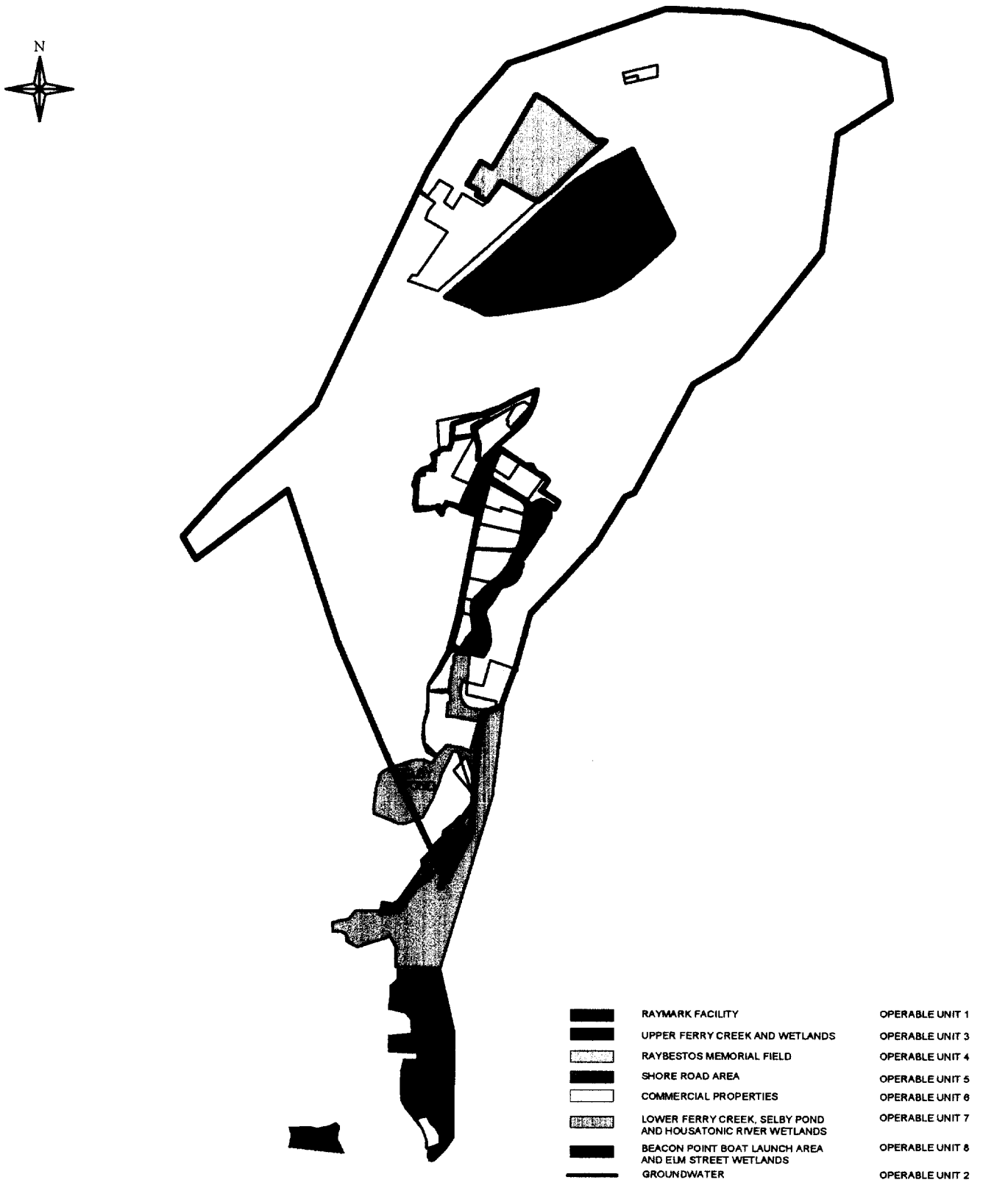
55 Jonspin Road Wilmington, MA 01887
(978)658–7899



NOTES:
1) ALL LOCATIONS AND BOUNDARIES TO BE CONSIDERED APPROXIMATE
2) PLAN NOT TO BE USED FOR DESIGN

RAYMARK OPERABLE UNITS		FIGURE 1-2
FIVE-YEAR REVIEW REPORT		TETRA TECH NUS, INC.
RAYMARK INDUSTRIES, INC. SUPERFUND SITE STRATFORD, CONNECTICUT		55 JONSPIN ROAD WILMINGTON, MA 01887 (978)658-7899
DRAWN BY D A CHISHOLM	DATE SEPTEMBER 5, 2000	
SCALE AS SHOWN	FILE VALLRAY APR	

- OU5 - The Shore Road Area
- OU6 - Commercial Properties
- OU7 - Lower Ferry Creek, Selby Pond, and the Housatonic River Wetlands
- OU8 - Beacon Point Boat Launch Area and Elm Street Wetlands

The activities conducted for the five-year review were based on EPA's *Structure and Components of Five-Year Reviews Guidance* and *Supplemental Five-Year Review Guidance* (OSWER Directive 9355.7-02A, July 1994). A Type I review was selected for this site because work on the remaining operable units will not be completed in the near future. Activities conducted to complete the five-year review included:

- Document Review: Applicable site-related documents were reviewed to become familiar with the site history and status. The documents and files that were reviewed are shown in the reference section.

- Standards/ARARs Review: Federal regulations which were listed in the ROD were reviewed and updated with revisions promulgated subsequent to the signing of the 1995 ROD. State standards and regulations and their applicability to the remedy at the site have been reviewed and verified by the CT DEP. The purpose of this review was to ensure that the selected remedy remains protective of human health and the environment, in light of revised standards. Table 3-1 presents the applicable standards as listed in the 1995 ROD, and the current status of the applicability of that standard to the OU1-Raymark Facility.

- Interviews: The State of Connecticut project manager and consultant were interviewed on operation and maintenance practices, and the Town of Stratford's Director of Health was consulted on impacts to local residents.

1.2 Description of the Remedy

As part of the Final Source Control Feasibility Study (FS) for OU1-Raymark Facility, remedial action objectives were developed for the site. These objectives were developed to mitigate existing and future potential threats to human health and the environment. As summarized in the ROD, these remedial action objectives were:

- To minimize direct exposures (incidental ingestion and dermal contact) to the contaminated soil-waste materials.

- To limit the leaching of contaminants to groundwater from on site sources.

- To minimize potential risk to human health associated with inhalation exposures to airborne asbestos and/or volatilized organic compounds.

Five source control alternatives were evaluated for OU1-Raymark Facility. Details of each are presented in the ROD. The selected remedy was decontamination, demolition, non-aqueous phase liquid (NAPL) removal, capping, and institutional controls.

The chronology of events following the signing of the ROD in July 1995, as documented in the Remedial Action Report (Foster Wheeler, 1999), is listed below.

- July 1995 – Completion of stockpiling of contaminated soils from residential removals and Wooster School removal
- September 1995 – Demolition of on-site buildings begins
- April 1996 – Building demolition complete
- October 1996 –RCRA cap liner system installation begins
- November 1996 –Treatment systems construction begins
- August 1997 – Liner system construction completed
- October 1997 – Final site grading work completed
- December 1997 – Site systems begin operations
- August 1998 – Turnover of operation and maintenance of site to CT DEP

As stated in the 1995 ROD, the selected "source control" remedy, a cap system for OU1-Raymark Facility, required the following:

- Decontamination and demolition of all Raymark Facility buildings and structures.

- Backfilling low-lying areas within the Raymark Facility with demolition materials and/or with those materials placed on the Raymark Facility from the residential and Wooster Middle School excavations.

- Compaction and grading of the site to provide the appropriate slope for the base of the cap.

- Removal of highly concentrated pockets of liquid (solvent) contamination from contact with groundwater from known areas.

- Capping of the site with a RCRA Subtitle C multi-layer cap.

- Ensuring the long-term integrity of the cap through an adequate operation and maintenance program and institutional controls (deed restrictions).

- Conducting routine monitoring of groundwater and surface water, and air monitoring at the site.

- Five-year reviews.

Details on the components described above can be found in the *Remedial Action Report for the Raymark Industries, Inc. Superfund Site, Raymark Industries Manufacturing Plant, Operable Unit 1* (Foster Wheeler, 1999) or the *Basis of Design/Design Analysis Report* (Foster Wheeler, 1996).

In addition, the ROD contains provisions for undertaking additional studies to further evaluate the extent of groundwater contamination beneath and migrating from the Raymark Facility. These studies are to determine whether this groundwater contamination is impacting, or may in the future impact, human and/or environmental receptors. These groundwater studies will also be used to evaluate the effectiveness of the selected source control remedy. The selected groundwater cleanup remedy will be addressed in a separate ROD as part of OU2-Groundwater.

The selected remedy for the Raymark Facility was a "source control" alternative, designed to provide containment of contaminated soils, control leaching of contaminants to the groundwater, and protect against surface erosion.

1.3 Report Organization

This five-year review report is organized as follows: Section 1.0, Introduction, presents the purpose and scope of the five-year review and a summary of the OU1 remedy; Section 2.0, Site Description and History, provides background information on the Raymark Facility and past operations as well as a description of all eight Raymark Industries, Inc. operable units; Section 3.0, Standards Review and Update, provides an evaluation of applicable or relevant and appropriate requirements (ARARs); Section 4.0, Site Visit Summary, presents a summary of the site visit; Section 5.0, Summary of Findings, provides a summary of findings of the five-year review including conclusions, recommendations, areas of non-compliance, a statement of protectiveness signed by the Office of Site Remediation and Restoration Director, and the date of the next five-year review.

2.0 SITE DESCRIPTION AND HISTORY

Background information including a description, current status, and future activities anticipated for each of the eight operable units associated with the Raymark Industries, Inc. Superfund Site is provided below. The locations of all eight operable units are shown on Figure 1-2.

2.1 History of the OU1-Raymark Facility

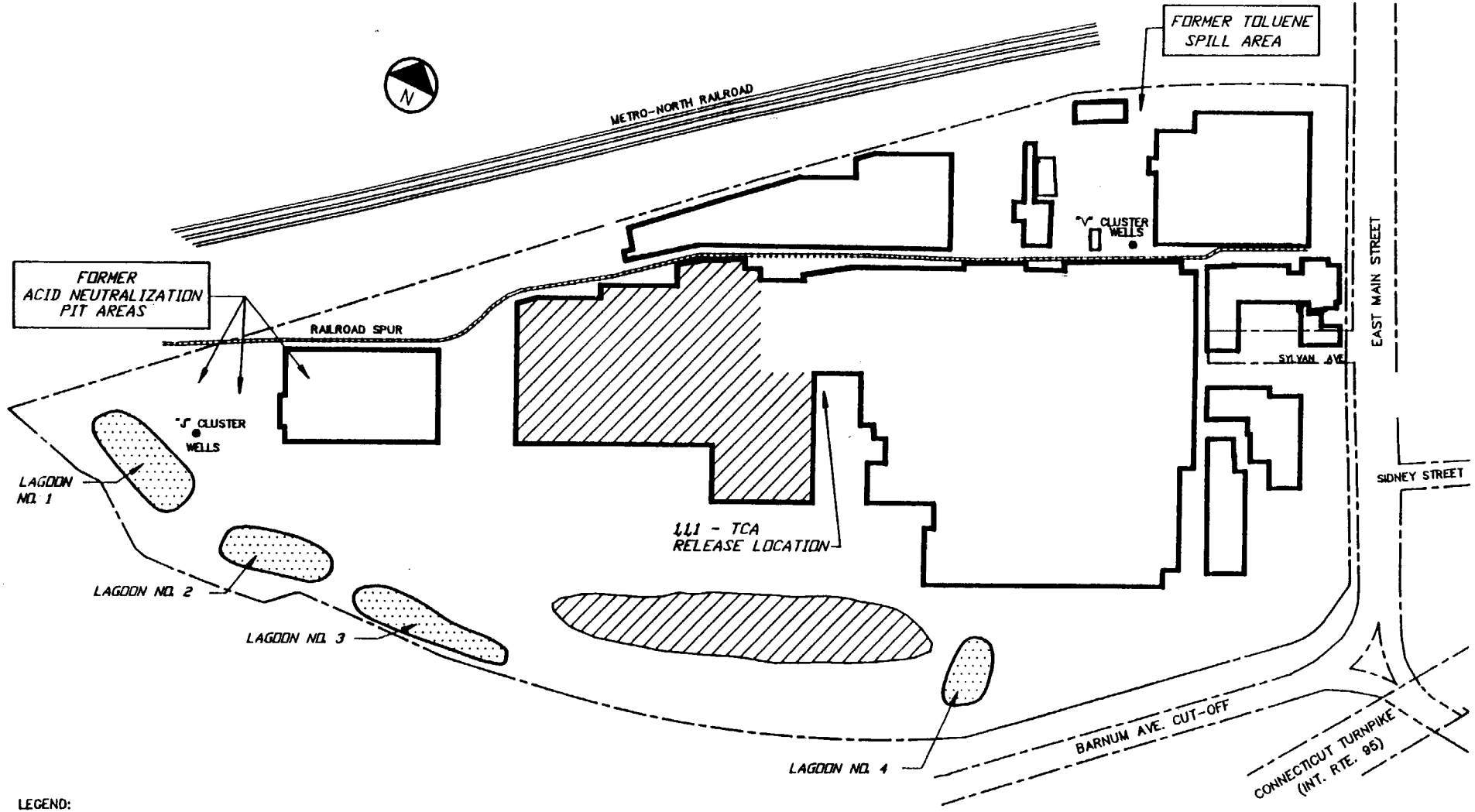
The OU1-Raymark Facility, formerly named Raybestos - Manhattan Company, was located at 75 East Main Street in Stratford, Fairfield County, Connecticut (see Figure 1-1). The Raymark Facility operated from 1919 until 1989, when the plant was shut down and permanently closed. Based on Stratford tax map information, the OU1-Raymark Facility occupied 33.4 acres and manufactured friction materials containing asbestos and non-asbestos components, metals, phenol-formaldehyde resins, and various adhesives. Primary products were gasket material, sheet packing, and friction materials including clutch facings, transmission plates, and brake linings. As a result of these activities, soils and groundwater at the OU1-Raymark Facility became contaminated.

Between 1919 and 1984, low-lying portions of the OU1-Raymark Facility were filled with manufacturing waste materials from various plant operations. The filling of those areas occurred over the life of the facility operations, and progressed essentially from north to south, across the property. New buildings and parking areas were constructed over these filled areas as the manufacturing facility expanded.

The OU1-Raymark Facility was underlain by an extensive, subsurface drainage system network. This network collected water and wastes from the manufacturing operations and diverted it into the facility drainage system. The system also collected stormwater runoff. These liquids were transported through the drainage system network, mixed with lagoon wastewaters, and discharged to Ferry Creek.

During peak operations at the OU1-Raymark Facility, approximately 2 million gallons of water were used for plant processes each day. Municipal water was used for both contact and non-contact cooling water. To supplement this source, an additional on-site supply well was installed. The well, located in the northeastern corner of the facility, was used for non-contact cooling water. Facility water was recirculated, with some percentage reinjected into the on-site well; the unused well water and municipal water were discharged through the facility drainage system. Wastewater from facility operations was collected and discharged to a series of four settling lagoons located in the southwestern corner of the facility, and along the southern property boundary near Longbrook Avenue and the Barnum Avenue Cutoff. The wastewater consisted of wastewater from the acid treatment plant, wet dust collection, paper making processes, non-contact cooling water, and wastewater from solvent recovery plant operations. The lagoons also received stormwater drainage and surface water runoff.

Solids were allowed to settle in Lagoon Nos. 1, 2, and 3 prior to discharge of clarified wastewater and unsettled solids to Lagoon No. 4, that in turn discharged directly into Ferry Creek. Discharge of wastewater to Lagoon Nos. 1, 2, and 3 ceased in 1984. These three lagoons were closed in December 1992 and January 1993. During the fall of 1994, stormwater drainage that exited the Raymark Facility through Lagoon No. 4 was diverted around this lagoon and connected directly to the storm sewer, which ultimately discharges to Ferry Creek. Lagoon No. 4 was closed in early 1995. Refer to Figure 2-1 for the locations of the former lagoons.



LEGEND:

- APPROXIMATE PROPERTY LINE
- BUILDING OUTLINE
- FORMER COVERED LAGOONS
- TEMPORARILY STORED RESIDENTIAL WASTE

NOTE:
NOT TO SCALE – ALL LOCATIONS APPROXIMATE

FORMER FACILITY FEATURES			
5-YEAR REVIEW			
RAYMARK – STRATFORD, CONNECTICUT			
DRAWN BY:	D.W. MACDOUGALL	REV.:	0
CHECKED BY:	D. CHISOLM	DATE:	SEPTEMBER 20, 2000
SCALE:	NOT TO SCALE	FILE NO.:	DWG\3883\0500\FIG_2-1.DWG

FIGURE 2-1

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55 Jonspin Road Wilmington, MA 01887
(978)658-7899

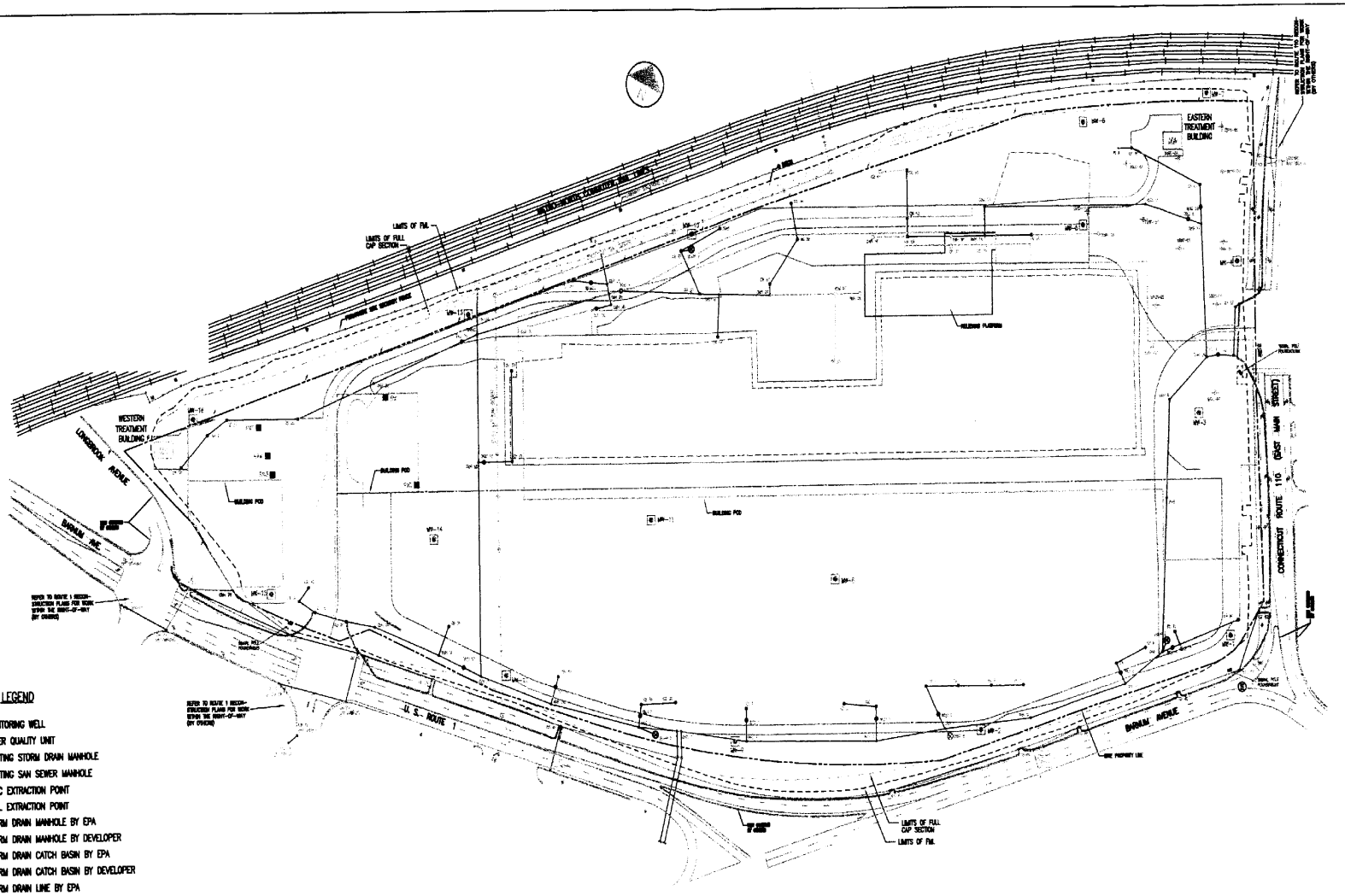
During the operation of the lagoons, the settled material in the lagoons was periodically removed by dredging. During the facility's 70 years of operation, it was common practice to dispose of both this dredged lagoon waste and other manufacturing waste as "fill" material (referred to as "Raymark soil-waste") both at the Raymark Facility and at various locations in Stratford.

A number of locations where Raymark soil-waste was disposed were contaminated with levels of asbestos, lead, and PCBs that posed a threat to public health. To abate the potential health threat to residential properties, residential locations were remediated under EPA CERCLA time-critical removal actions during 1993 to 1996. The excavated material from these residential locations was stored and ultimately placed under the cap at the OU1-Raymark Facility. Waste from one municipal property, Wooster Middle School, was also excavated, stored, and ultimately placed under the cap at the OU1-Raymark Facility.

A substantial number of field investigations relating to soil, sediment, surface water, biota, and groundwater have been conducted at the Raymark Facility and its environs.

2.2 OU1 – Raymark Facility

Cleanup of the source at the OU1-Raymark Facility is complete. EPA completed a Remedial Investigation and Feasibility Study for controlling sources of waste at the 33-acre Raymark Facility in 1995 describing the type and location of wastes, the risks posed by those wastes, and discussed possible cleanup solutions. After receiving public comments, EPA decided to consolidate Raymark wastes excavated from the residential areas and the Wooster Middle School at the OU1-Raymark Facility and cap the property. EPA documented this decision in a ROD in June 1995. Once the approach was selected, EPA began the actual cleanup. This included demolition of 15 acres of buildings, consolidation of over 100,000 cubic yards of off-site Raymark waste and the placement of an impermeable cap with a soil gas collection system over the entire property. Solvents, called dense non-aqueous phase liquids (DNAPLs), in the underlying groundwater and gases beneath the cap are treated at facilities onsite. Final construction was completed in November 1997. The site is now operated and maintained by the CT DEP. Refer to Figure 2-2 for a current site layout.



LEGEND

- MW-6 MONITORING WELL
- WQU-6 WATER QUALITY UNIT
- EXISTING STORM DRAIN MANHOLE
- EXISTING SAN SEWER MANHOLE
- ESGC-05 ESGC EXTRACTION POINT
- NAPL EXTRACTION POINT
- SMH 3 STORM DRAIN MANHOLE BY EPA
- SMH 10 STORM DRAIN MANHOLE BY DEVELOPER
- CB 33 STORM DRAIN CATCH BASIN BY EPA
- CB 45 STORM DRAIN CATCH BASIN BY DEVELOPER
- STORM DRAIN LINE BY EPA
- STORM DRAIN LINE BY DEVELOPER
- TRAFFIC SIGNAL
- RELOCATED UTILITY POLE
- EXISTING UTILITY POLE
- FIELD INLET
- SUMP 1 SUMP

NOTES:

PLAN CREATED BY FOSTER WHEELER ENVIRONMENTAL CORP.

FOSTER WHEELER ENVIRONMENTAL CORPORATION
470 ATLANTIC AVENUE
BOSTON, MASSACHUSETTS 02210

GRAPHIC SCALE
0' 200' 400'
1 INCH = 200 FEET

EPA FINAL SITE LAYOUT		FIGURE 2-2	
FIVE-YEAR REVIEW		TETRA TECH NUS, INC.	
RAYMARK INDUSTRIES, INC. SITE STRAFORD, CT		55 Jonspin Road Wilmington, MA 01887 (978)658-7899	
DRAWN BY: J. PICCUITO	REV.: 0		
CHECKED BY: D. CHISOLM	DATE: SEPTEMBER 20, 2000		
SCALE: 1" = 200'	FILE NO.: DWG\3883\0500\FIG_2-2.DWG		

The components of the selected remedy that are ongoing at the site include removal of NAPLs, ensuring the long-term integrity of the cap, and routine monitoring. A maintenance and monitoring schedule has been developed so systems at the facility remain operational, thereby ensuring the remedy remains protective of human health and the environment. Subsystems associated with these components are operated and monitored from the western and eastern treatment building onsite, and include the following as described in Section 2.0 of the Final Operation and Maintenance Manual (Foster Wheeler, 1998):

- Site grounds including fencing, paving, and landscaping.
- Stormwater system including the liner system water collection sumps.
- Soil Gas Collection (SGC) system including the piping system, blowers, thermal oxidizer, condensate collection system, carbon vessels, drip legs, and vacuum monitoring points.
- Enhanced Soil Gas Collection (ESGC) System including the piping, air injection blowers, off-gas blowers, thermal oxidizer, and condensate collection system.
- DNAPL pumping system including well head vaults, piping, DNAPL storage tank, and associated pumping and monitoring devices.
- Groundwater monitoring wells.

The stormwater system collects site surface runoff through catch basins and trench drains and conveys the collected runoff to gross-particle/oil water separators before discharge to the CT Department of Transportation (CT DOT) drainage system and Ferry Creek. Four sumps along the boundary of the site collect subsurface water that runs off the top of the cap liner. Water in these sumps is pumped directly into an adjacent storm sewer.

The western and eastern SGC systems control volatile organic emissions from the soil-waste materials beneath the cap to prevent vapor migration off-site or into future on-site buildings. The systems consist of a high permeability vapor collection layer beneath the cap's hydraulic barrier. Eleven conveyance zones of piping were installed in this sand layer. Each zone pipe has a drip leg to collect water that condenses in the pipe. Approximately 5 gallons are pumped each week from the drip legs and stored in 55-gallon drums in each of the treatment buildings. Water collected from the drip legs is discharged to the sanitary sewer and is sampled quarterly. Blowers provide vacuum for the piping systems. All soil gas collected by the blowers in the eastern treatment building is treated with a thermal oxidizer prior to discharge. All soil gas

collected by the blowers in the western treatment building is treated with granular activated carbon prior to discharge.

In the northeast portion of the site, in the area of the historic toluene spill, the ESGC system consists of 12 wells screened above the water table. The wells are connected to the eastern treatment building, and soil gases are pumped and treated in the same manner as the SGC system.

The DNAPL recovery system is comprised of a series of five extraction wells located on the western portion of the site (Figure 2-2) where the concentrations of contaminants were greater than one percent of the solubility limit in groundwater. Pumps are installed in 2 of the 5 wells. DNAPL recovered from these wells is pumped to the DNAPL storage tank located in the western treatment building. The storage tank is equipped with a level indicator, which automatically shuts down the pumps if the storage tank is full. An epoxy coated steel containment barrier surrounds the storage tank itself. Refer to the Operation and Maintenance Manual for inspection tasks associated with the DNAPL recovery system.

Fifty-three groundwater monitoring wells were installed in 16 clusters located throughout the site to provide long term monitoring data that will describe groundwater quality and flow regime in the water bearing formations beneath the cap. The Final Operation and Maintenance Manual (Foster Wheeler, 1998) provides a schedule of groundwater monitoring to be performed as part of the post-closure care of the site.

The cap was constructed so that redevelopment of the property could take place. Wal-Mart Real Estate Business Trust, STFD, LLC, and Home Depot U.S.A, Inc. purchased the property in February, 2000. Construction of a retail center is scheduled to begin in 2000. A final cleanup remedy for groundwater beneath this area (and other Raymark-contaminated areas in Stratford) is still being developed, and is discussed below as part of OU2.

2.3 OU2 - Groundwater

The Remedial Investigation/Feasibility Study is in progress. This groundwater investigation focuses on a 500-acre study area largely downgradient of the OU1-Raymark Facility that has become contaminated with volatile organic compounds (VOCs) and metals, presumably from

Click here to go to Section 2.5

the activities conducted on the property. The study area includes businesses that have handled or continue to handle hazardous materials, but investigations are focused on groundwater contaminants that appear to be attributable to the OU1-Raymark Facility. Currently, groundwater in this operable unit is not used as a drinking water supply. In some portions of the study area, contaminants in the groundwater appear to be volatilizing, or discharging to surface water, which may pose a threat to human health or the environment.

EPA intends to issue a Final Remedial Investigation in 2001 describing contamination and potential health risks for this operable unit. EPA also plans to release a Feasibility Study, analyzing potential cleanup solutions for the area, in 2001/2002. Possible remediation alternatives include no action; limited pumping and treating; and in-situ groundwater treatment.

2.4 OU3 - Upper Ferry Creek and Associated Wetlands

The Remedial Investigation for this operable unit is complete, and the Feasibility Study is in progress. This 33-acre area encompasses Ferry Creek and adjacent wetlands where Raymark wastes were deposited through dumping or erosion (see Figure 1-2). To minimize public contact with contaminated soils, the CT DEP initially put a fence around the Morgan Francis property, which is part of this area. CT DEP also covered parts of this area that had high levels of contamination with paving, wood chips and geotextile fabric, or clean fill. EPA has sampled this area to identify the extent of contamination.

EPA released a Remedial Investigation in 1999 that described contamination and potential health risks in this area. EPA plans to release a Feasibility Study in 2001 analyzing potential cleanup solutions for the area. Possible remediation options include isolating Ferry Creek using pipes or culverts; using rip-rap on the banks of Ferry Creek to prevent further erosion; fencing; removal of contaminated sediment (approximately 11,000 cubic yards); and treatment of contaminated sediment in place. Cleanup solutions for the commercial properties in this area will be evaluated in a separate Feasibility Study as part of OU6. Cleanup solutions for this operable unit will depend, in part, on the selected groundwater remediation alternative for OU2.